EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Robert Biddle on 10/23/2009.

The application has been amended as follows:

1) In the Specification ("BRIEF DESCRIPTION OF THE DRAWING" section):

On page 6, after line 11,

insert -- FIG. 2J is a block diagram generally depicting details of contour sensor unit 240.

FIG. 2K is a diagram generally depicting a work piece within the un-calibrated pixel coordinate space of the sensor unit. –

2) Please replace all the claims with the following:

1. (AMENDED) A measurement system comprising:

a sensor chassis configured to capture ~~the~~ a substantially 360○ profile of an object within a predetermined work zone ~~and output data representative of said object:~~

a control unit for receiving and processing data received from said sensor chassis.;

said sensor chassis comprises a plurality of contour sensors, each substantially aligned with said work zone so that an object within said work zone is at least partially within the field of view (FOV) of each of said contour sensors;

each of said contour sensors is configured to generate and output data representative of at least a partial profile of an object within the contour sensors respective FOV; ~~and~~

the sensor chassis is further configured to allow for the capture of a substantially 360 profile of an object in the work zone without any part of the measurement system coming in contact with the object.; ~~and~~

said control unit is further configured to correlate a coordinate space associated with at least two or more contour sensors with a common coordinate space, generate profile data representative of a substantially 360 profile of a predetermined object; and

the control unit is further configured to correlate the coordinate space associated with a reference template with said common coordinate space and to compare said profile data with said reference template to determine differences between said profile data and said reference template.

2. (CANCELLED) The measurement system of claim *1* wherein said sensor chassis comprises at least two contour sensors, each aligned with said work zone so that an object within said work zone is at least partially within the field of view (FOV) of each of said contour sensors.

3. (AMENDED) The measurement system of claim ~~2~~ 1 wherein said contour sensors are aligned with said work zone, so as to allow for the collective capture of substantially a 360° view of ~~an~~ the object within said work zone.

4. (CANCELLED) The measurement system of claim 1 wherein said sensor unit comprises four contour sensors, each aligned with said work zone so as to capture a view of an object within said work zone.

5. (AMENDED) The measurement system of claim ~~4~~ 1 wherein said contour sensors are aligned so as to allow for the collective capture of a substantially 360○ view of an object within said work zone.

6. (AMENDED) The measurement system of claim 5 wherein said contour sensors are substantially radially aligned with the center of said work zone ~~substantially at the center~~.

7. (AMENDED) The measurement system of claim ~~2~~ 5 wherein said contour sensors are substantially radially aligned with the center of said work zone at 90° intervals about the work zone.

8. (AMENDED) The measurement system of claim ~~2~~ 1 wherein one or more of said contour sensors comprises an illumination unit ~~for~~ configured to generate ~~generating~~ and ~~outputting~~ output a light beam of a predetermined wavelength, and a detector unit responsive to light of said predetermined wavelength.

9. (AMENDED) The measurement system of claim ~~8~~ 1 wherein one or more of said contour sensors comprise a "sheet of light" contour sensor.

10. (AMENDED) The measurement system of claim ~~8~~ 1 wherein one or more of ~~each of~~ said contour sensors comprise a flying spot ~~time~~ of ~~flight~~ light contour sensor.

11. (AMENDED) The measurement system of claim ~~7~~ 1 wherein said sensor chassis is configured to allow said contour sensors to be rotatably adjusted about said work zone.

12. (ORIGINAL) The measurement system of claim 1 wherein said control unit comprises a visualization module for generating data to cause textual or graphical information to be displayed on an associated display device.

13. (ORIGINAL) The measurement system of claim 1 wherein said control unit comprises a measurement module for carrying out a predetermined calculation.

14. (ORIGINAL) The measurement system of claim 13 wherein said measurement module is further configured to calculate the distance between features of a profile based upon identified control points.

15. (ORIGINAL) The measurement system of claim 13 wherein said measurement module is further configured to calculate an angle of a feature in a profile based upon two identified line segments.

16. (ORIGINAL) The measurement system of claim 13 wherein said measurement module is further configured to determine variance between a profile and a predetermined profile reference.

17. (ORIGINAL) The measurement system of claim 13 wherein said measurement module is further configured to determine the radius and center point of an arc.
18. (ORIGINAL) The measurement system of claim 1 wherein said control unit further comprises a registration module for establishing a correlation between a first coordinate system and a second coordinate system.

19. (ORIGINAL) The measurement system of claim 18 wherein said first coordinate system comprises a sensor coordinate system and said second coordinate system comprises a chassis coordinate system.

20. (AMENDED) ~~A method of evaluating a substantially 360○ profile of a work piece, comprising the steps of:~~ A measurement system comprising:

a sensor chassis configured to capture ~~the~~ a substantially 360○ profile of an object within a predetermined work zone;

a control unit for receiving and processing data received from said sensor chassis;
said sensor chassis comprises a plurality of contour sensors, each substantially aligned with said work zone so that an object within said work zone is at least partially within the field of view (FOV) of each of said contour sensors;
each of said contour sensors is configured to generate and output data representative of at least a partial profile of an object within the contour sensors respective FOV;

the sensor chassis is further configured to allow for the capture of a substantially 360 profile of an object in the work zone without any part of the measurement system coming in contact with the object; and

said control unit is further configured to correlate a coordinate space associated with at least two or more contour sensors with a common coordinate space and generate profile data representative of a substantially 360○ profile of the object in the work zone.

~~correlating the coordinate space associated with two or more contour sensors with a common coordinate space; and~~

~~generating profile data representing a substantially 360○ profile of a predetermined work piece.~~

21. (AMENDED) The ~~method~~ system of claim 20 wherein the control unit is further configured to ~~comprising the step of correlating~~ correlate the coordinate space associated with a reference

template with said common coordinate space; and

~~comparing~~ compare said profile data with said reference template to determine differences between said profile data and said reference template.

22. (CANCELLED) A non-contact measurement system comprising a sensor unit configured to determine the diameter of a work piece.

23. (CANCELLED) The system of claim 22 wherein said sensor unit comprises a detector unit for receiving light reflected from a work piece.

24. (CANCELLED) The system of claim 23 wherein said sensor unit is configured to generate data representing coordinate values for points along the profile of said work piece based upon received light reflected from said work piece.

25. (CANCELLED) The system of claim 24 wherein said sensor unit is further configured to determine a diameter of said work piece based upon said received light reflected from said work piece.

26. (CANCELLED) The system of claim 24 wherein said sensor unit is further configured to determine a diameter of said work piece based upon application of a best fit of a circle of a known diameter to the points represented by said coordinate values

27. (CANCELLED) The system of claim 24 wherein said sensor unit is further configured to determine a center point of said work piece based upon application of a best fit of a circle of a known diameter to the points represented by said coordinate values.

28. (CANCELLED) The system of claim 25 wherein said sensor unit is configured to output data representing the value of said diameter.

29. (CANCELLED) The system of claim 26 wherein said sensor unit is configured to output data representing the coordinate values for said center point.

30. (CANCELLED) The system of claim 22 wherein said sensor unit further comprises an illumination unit for emitting light for illuminating a work piece.

31. (CANCELLED) The system of claim 30 wherein said illumination unit comprises a laser light source.

32. (CANCELLED) The system of claim 31 wherein said illumination unit comprises a sheet of light laser.

33. (CANCELLED) The system of claim 30 wherein said sensor unit further comprises a detection unit for receiving light reflected from said work piece.

34. (CANCELLED) The system of claim 33 wherein said detection unit comprises a charged coupled device (CCD).

35. (CANCELLED) The system of claim *1* wherein said control unit is configured to:

correlate a coordinate space associated with at least two or more contour sensors with a common coordinate space; and

generate profile data representative of a substantially 360 profile of a predetermined object.

36. (CANCELLED) The system of claim 35 wherein said control unit is further configured to:
correlate the coordinate space associated with a reference template with said common coordinate space; and

compare said profile data with said reference template to determine differences between said profile data and said reference template.

37. (AMENDED) The system of claim ~~35~~ 1 wherein said control unit is configured to determine the diameter of an object within the work zone.

38. (AMENDED) The system of claim ~~35~~ 1 wherein one or more of said contour sensors comprise a detector unit for receiving light reflected from an object within said work zone.

39. (NEW) The system of claim 38 wherein one or more of said plurality of contour sensors is configured to generate data representing coordinate values for points along the profile of at least a portion of an object within a respective FOV based upon received light reflected from said object.

40. (CANCELLED)

41. (NEW) The system of claim 37 wherein said control unit is further configured to determine a diameter of said work piece based upon application of a best fit of a circle of a known diameter to the points represented by said coordinate values.

42. (AMENDED) The system of claim ~~35~~ 1 wherein said control unit is further configured to determine a center point of said work piece based upon application of a best fit of a circle of a known diameter to the points represented by said coordinate values.

43. (NEW) The system of claim 41 wherein said control unit is configured to output data representing the value of said diameter.

44. (NEW) The system of claim 42 wherein said control unit is configured to output data representative of the coordinate values for said center point.

45. (NEW) The system of claim 1 wherein one or more of said contour sensors comprise a detection unit for receiving light reflected from said object.

46. (NEW) The system of claim 45 wherein said detection unit comprises a charged coupled device (CCD).

47. (NEW) The system of claim 1 wherein one or more of said contour sensors comprises an ultrasonic sensor responsive to ultrasonic radiation.

48. (NEW) The system of claim 1 wherein one or more of said contour sensors compnses a detector unit responsive to radiation of a predetermined wavelength.

49. (NEW) The measurement system of claim 48 wherein one or more of said contour sensors further comprises an emitter for emitting radiation of said predetermined wavelength.

50. (NEW) The measurement system of claim 1 wherein one or more of said contour sensors comprises a stereo imaging sensor.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

With respect to claim 1, the prior art of record, taken a lone or in combination, fail to disclose a measurement system comprising: the sensor chassis is further configured to allow for the capture of a substantially 360 profile of an object in the work zone without any part of the measurement system coming in contact with the object; said control unit is further configured to correlate a coordinate space associated with at least two or more contour sensors with a common coordinate space, generate profile data representative of a substantially 360 profile of a predetermined object; and the control unit is further configured to correlate the coordinate space associated with a reference template with said common coordinate space and to compare said profile data with said reference template to determine differences between said profile data and said reference template, which structurally arranged and functionally operated as claimed in claim 1 in combination with all the limitations in the claim.

With respect to claim 20, the prior art of record, taken a lone or in combination, fail to disclose a measurement system comprising: the sensor chassis is further configured to allow for the capture of a substantially 360 profile of an object in the work zone without any part of the measurement system coming in contact with the object; and said control unit is further configured to correlate a coordinate space associated with at least two or more contour sensors with a common coordinate space and generate profile data representative of a substantially 360○ profile of the object in the

work zone, which structurally arranged and functionally operated as claimed in claim 20 in combination with all the limitations in the claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TU T. NGUYEN whose telephone number is (571)272-2424. The examiner can normally be reached on T-F 7:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury can be reached on (571) 272-2800 Ext. 86. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tu T. Nguyen/
Primary Examiner, Art Unit 2886

10/25/2009